

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-32. (Cancelled).

33. (New) A method of inhibiting apoptosis in a subject, said method comprising: administering a therapeutically effective amount of α_1 -antitrypsin, an oxidation-resistant α_1 -antitrypsin Met³⁵⁸ variant or a free radical-resistant α_1 -antitrypsin M³⁵⁸ variants, in which the effective amount inhibits apoptosis, and monitoring a decrease in apoptosis; wherein the subject suffers from at least one of arthritis, muscular dystrophy, multiple sclerosis, arteriosclerosis, autoimmune disease, ischemia-reperfusion injury, neurodegenerative disease, myocardial infarction, or stroke.

34. (New) The method of Claim 33, wherein the effective amount is at least 0.001 and no greater than 70 g/kg body weight.

35. (New) The method of Claim 33, further comprising administering at least one free radical scavenger or inhibitor.

36. (New) The method of Claim 33, in which the subject is a human.

37. (New) The method of Claim 33, in which the therapeutically effective amount is sufficient to provide at least 10 pM and no greater than 2 mM of the inhibitor in the biological fluid of the subject.

38. (New) The method of Claim 37, in which the biological fluid is blood.

39. (New) The method of Claim 37, in which the therapeutically effective amount is sufficient to provide at least 0.5 μ M and no greater than 2000 μ M in the biological fluid of the subject.

40. (New) The method of Claim 33, in which the administering is parenterally, orally, vaginally, rectally, nasally, buccally, intravenously, intramuscularly, subcutaneously, intrathecally, epidurally, transdermally, intracerebroventricularly, by osmotic pump, by inhalation, or combinations thereof.

41. (New) The method of Claim 33, in which the therapeutically effective amount is administered at least once daily and no more than once hourly.

42. (New) The method of Claim 33, wherein the neurodegenerative disease is Alzheimer's disease or Downs Syndrome.

43. (New) A method for treating a disease in a subject by inhibiting apoptosis, wherein the disease comprises arthritis, muscular dystrophy, multiple sclerosis, arteriosclerosis, autoimmune disease, ischemia-reperfusion injury, neurodegenerative disease, myocardial infarction, or stroke, said method comprising administering a therapeutically effective amount of α_1 -antitrypsin, an oxidation-resistant α_1 -antitrypsin Met³⁵⁸ variant or a free radical-resistant α_1 -antitrypsin M³⁵⁸ variants to inhibit apoptosis thereby ameliorating the disease in the subject.